IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:	Ryoto Shima et al.	Confirmation No.: 5304
Serial No.:	10/509,267	
Group Art Unit:	1796	
Filed:	October 27, 2004	
Examiner:	Nguyen, Khanh Tuan	
For:	ELECTRICALLY CONDUCTIVE SILICONE RUBBER COMPOSITION	

SECOND DECLARATION UNDER 37 CFR § 1.132

MAILSTOP: AMENDMENT
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Dear Sir:

I, Kazumi Nakayoshi, hereby state that:

1. I am a citizen of Japan.

2. I have a bachelor degree from KYUSHU University in Fukuoka Prefecture, Japan. I am currently employed in a conductives & adhesives product development group leader role for Dow Corning Toray Co., Ltd. of Tokyo, Japan. I have worked in the silicone field for 23 years and I have been employed by Dow Corning Toray Co., Ltd. for the past 23 years.

3. I am the second named inventor of the pending U.S. Patent Application, Serial

No. 10/509,267, and a person highly skilled in the art of silicones including silicone rubber compositions and methods for producing such silicone rubber compositions including, in particular, electrically conductive silicone rubber compositions.

4. In the present application, the invention, an electrically conductive silicone rubber composition, includes (A) 100 parts by weight of an organopolysiloxane having at least two alkenyl groups per molecule and (B) an organopolysiloxane having at least two silicon-bonded hydrogen atoms per molecule, which is present in an amount to provide from 0.1 mol to 10 mol of silicon-bonded hydrogen atoms from component (B) per 1 mol of alkenyl groups of component (A) and which is sufficient to cure the electrically conductive silicone rubber composition. The electrically conductive silicone rubber composition further includes (C) an amount sufficient to promote cure of the composition, of a platinum based catalyst, (D) 300 to 5,000 parts by weight of a metal based electrically conductive filler, and (E) 5 to 500 parts by weight of spherical silicone rubber particles with a surface active agent content of greater than 0 but not more than 0.3 wt%. As described in paragraph [0015] of our application, the invention is characterized, among other things, by this specific surface active agent content.

5. Elaborating now on the importance of our spherical silicone rubber particles with a surface active agent content of greater than 0 but not more than 0.3 wt%, as described in paragraph [0030] of our application, the wt% content of the surface active agent affects viscosity of the electrically conductive silicone rubber composition. For example, the

electrically conductive silicone rubber composition of this invention exhibits little thickening due to the addition of component (E). Further, with reference to our examples, it is shown that having ***higher*** than 0.3 wt% of a surface active agent, e.g. 0.5 wt% (see Reference Example 1), leads to marked increases in viscosity, such that homogenous compositions could not be prepared. However, using 0.3 wt% or less of a surface active agent, e.g. 0.1 wt% (see Reference Example 2), leads to little to no increase in viscosity of the compositions prepared (see paragraphs [0030] and [0037]). As shown through the examples in our application, conventional methods of preparing the electrically conductive silicone rubber composition using a surface active agent results in surface active agent contents that are in excess of those as claimed in our claims (see Reference Example 1), and *additional* steps are required to lower the surface active agent content (see Reference Example 2).

6. I am aware of, have read, and understand the disclosure of U.S. Patent No. 5,229,037 to Nakano et al. (the '037 patent), which is entitled "ELECTROCONDUCTIVE SILICONE RUBBER COMPOSITION CONTAINING A METAL", an equivalent of which is the disclosure of Japanese (JP) Patent No. 03146557 to Nakano et al., which is entitled "ELECTRICALLY CONDUCTIVE SILICONE RUBBER COMPOSITION AND CURED PRODUCT THEREOF".

7. I was previously aware of the '037 patent, since the '037 patent was one reference studied at the time of application for our invention. Referring to paragraph [0002] of our application, the '037 patent prepares spherical silicone rubber particles by curing a

silicone rubber composition in an emulsified state in an aqueous solution of a surface active agent then drying it in a spray dryer. However, these silicone rubber particles increased viscosity of electrically conductive silicone rubber compositions to which they were added. Furthermore, attempting to produce electrically conductive silicone rubber with low compression set by adding these silicone rubber particles caused a marked increase in viscosity of the resultant conductive silicone rubber composition, which rendered preparation of a homogeneous composition impossible. Since the '037 patent employed conventional methods of preparing spherical silicone rubber particles known in the art, we used the teachings of the '037 patent as Reference Example 1 in our application.

8. As such, for the reasons described in paragraphs 5 and 7 above, and in paragraphs 9 through 11 immediately below, the invention in the present application is unique and distinguishable from the '037 patent. Specifically, the '037 patent does not necessarily teach the electrically conductive silicone rubber composition of the present invention. Instead, the '037 patent only broadly teaches an electrically conductive silicone rubber composition. More importantly, the electrically conductive silicone rubber composition taught by the '037 patent has a higher surface active agent content than the surface active agent content as claimed in our invention.

9. Specifically, after again closely analyzing the '037 patent, I can find nothing in the '037 patent that teaches spherical silicone rubber particles having any particular surface active agent content, especially spherical silicone rubber particles having a surface active

agent content of greater than 0 but not more than 0.3 wt%, as claimed for our invention. As alluded to above, I recognize that the '037 patent describes various methods of making silicone rubber particles, including a method of using surface active agents in aqueous solutions to make emulsions that are now well known to those skilled in the silicone art, such as myself (see, e.g. column 3, line 65 through column 4, line 28). *However*, the '037 patent does not teach a surface active agent content of the silicone rubber made by such methods. In fact, the method described in the '037 patent is silent with regard to an amount of a surface active agent employed to make their emulsions and therefore their silicone rubber (see column 4, lines 9-11). Further, the '037 patent does not even mention the use of a surface active agent in its examples (see generally column 7), which illustrates that use of surface active agents is by no means an important aspect of the '037 patent. As such, one of ordinary skill in the art would not have had reason to optimize such a variable, since no benefit of doing so was taught or even suggested.

10. Upon further investigation of Japanese Patent Kokai 62-257939 (the '939 patent), which is cited in the '037 patent in column 4, line 5, again, there is no teaching of a surface active agent content in an emulsion taught by the '939 patent. Further, in an example of the '939 patent, 3 parts by weight of a surface active agent is used per 110 parts by weight of a curable organopolysiloxane composition. Since this example of the '939 patent was carried out in the same way as our Reference Example 1 of the present application, the content of the surface active agent will be approximately 0.5 wt%. In other words, the only

teaching of the '939 patent is above 0.3 wt% surface active agent content, and is in fact congruent with our Reference Example 1, as described above. As taught in the '037 patent, the '939 patent uses surface active agents in a manner to form emulsion particles having a particle diameter not exceeding 20 μm (see column 4, lines 10-11). In this particular manner, increasing the amount of surface active agent decreases particle diameter of the emulsion particles, as understood by those skilled in the art, such as myself. As described in the '037 patent, when the average particle diameter of the spherical particles is too large, the resulting silicone rubber composition has poor workability during molding (see column 4, lines 15-29). One of ordinary skill in the art would choose to decrease particle diameter of the emulsion particles, by increasing the amount of surface active agent employed, in order to increase workability during molding of the resulting silicone rubber composition. As such, the content of the surface active agent would be greater than 0.5 wt%.

11. As described above, I believe that Reference Example 1 of the present application falls within the steps of the methods taught by the '037 patent. More importantly, it can be concluded that greater than 0.3 wt% of surface active agent content is present in the silicone rubber particles disclosed by the '037 patent, and thus, a teaching of a surface active agent content of greater than 0 but not more than 0.3 wt% is not necessarily present in the '037 patent. To elaborate, first, the '037 patent does not teach a specific amount of surface agent employed to form its silicone rubber, and more importantly, makes no mention whatsoever of an end surface active agent content in its silicone rubber. Second, various

amounts of a surface active agent, which can eventually yield a surface active agent content greater than 0.3 wt%, can be used to make the silicone powder of the '037 patent, such as described above with regard to the '939 patent. Third, there is no teaching of any steps that would in fact *reduce* the surface active agent content of the silicone rubber, and more importantly there is no teaching or even a suggestion of desirability to reduce the content of the surface active agent in the silicone powder. Rather, the '037 patent only teaches a step of spray-drying the emulsion to obtain the silicone rubber from the emulsion. *Conversely*, as described in our application, our spherical rubber particles are generally post-treated, such as by filtering and rinsing the spherical rubber particles with water, to obtain our desired surface active agent content of greater than 0 but not more than 0.3 wt% (see Reference Example 2 and paragraph [0016] in our application).

Conclusion

12. As a result of my review of the '037 patent and also as a result of my understanding from a perspective of one skilled in the silicone art, the invention as claimed at the time of filing the patent application presented, and still presents, differences from the '037 patent both on an individual basis and even when combined. Specifically, even when combined with other references, the '037 patent does not teach an electrically conductive silicone rubber composition including spherical silicone rubber particles with a surface active agent content of greater than 0 but not more than 0.3 wt%, as in the present invention. In addition, the '037 patent only broadly teaches using surface active agents for formation of

silicone rubber particles, which was already well known in the art. One skilled in the art, at the time of filing the present application, would not have linked specific surface active agent contents with these drastic changes in viscosity, as in the present invention, since the methods taught by the '037 patent only minimally describe the use of surface active agents. As alluded to in paragraph 10 above, the '037 patent instead motivates one of ordinary skill in the art to increase the content of the surface active agent in the silicone powder in order to increase workability.

13. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information are believed to be true, and further that these statements were made with the knowledge that willful and false statements and the like are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or patent issued thereon.

Respectfully submitted,

December 9, 2008

Dated
December 9, 2008

Kazumi Nakayoshi

Kazumi Nakayoshi